

Doped Iron Garnets for Nonreciprocal Photonics

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- This work focuses on fabrication of:
 - Integration of important magneto-optical oxides with Si photonics.
 - Layers of Yttrium Iron Garnet ($Y_3Fe_5O_{12}$) were grown on Si.
 - Films transformed into mixed amorphous and crystalline YIG phases upon annealing.
 - Thicker layers can lead to more homogeneous films.

- Results and Observations:

- YIG seeds were used to grow Ce- and Bi-substituted YIG optical claddings.
- Films grow without cracks and do not contain secondary phases.
- Faraday rotations of at least $3800^\circ/\text{cm}$ have been measured.

*YIG crystallites in amorphous matrix of seedlayers.
Doped films grown on these seedlayers have high
magneto-optical activity and are successfully
integrated with Si*

